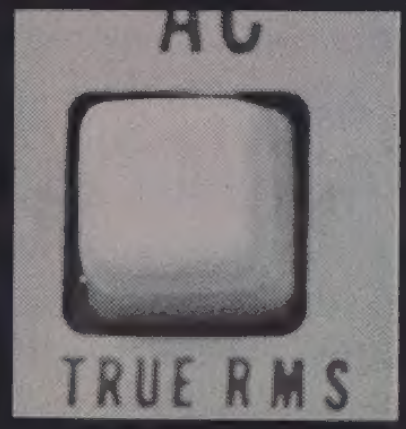
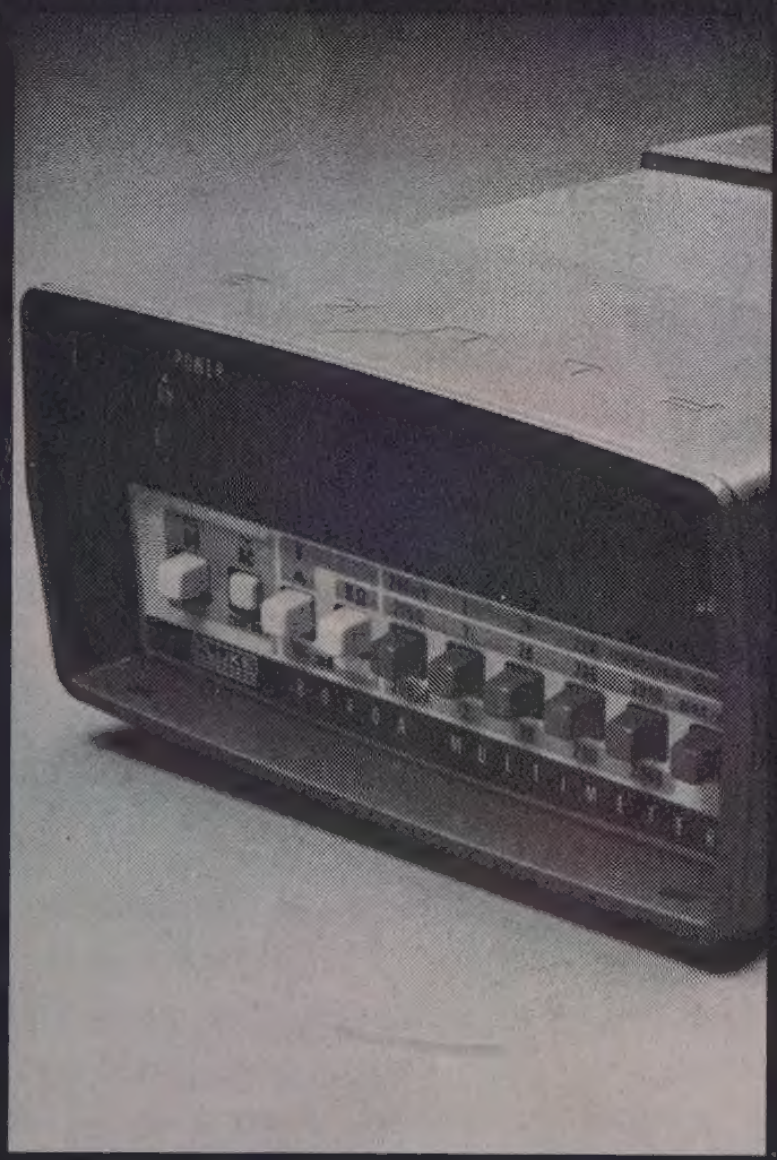
8040A
operators manual





FLUKE

The 8040A provides five ranges for ac and dc voltage or current measurements and six ranges for resistance measurements. The ac voltage and current measurements are made using a true rms conversion technique for improved accuracy in communications and industrial control applications. The increase in accuracy of the true rms responding 8040A as compared to average responding meters is most noticeable when measuring noise or distorted waveforms.

The physical features of the 8040A were also selected to enhance the useability of the instrument. The small size makes the 8040A easy to carry in a brief case or service kit, yet provides a large easy to read display and well spaced pushbutton controls. The fold-away stand makes bench top use more convenient. A slide out sunshade improves the readability of the display in high ambient light conditions, and side mounted test lead connections insure that the leads are handy without getting in the way of the display or controls.

You are urged to read the contents of this manual and follow the Assembly and Initial Operation Instructions to insure that you will become familiar with each function of the 8040A.

ASSEMBLY AND INITIAL OPERATION

It is recommended that the assembly and initial operation of the 8040A be done in accordance with the following procedure. This procedure does not require the use of any test equipment; all signals observed are generated by the 8040A. The procedure is also intended to be used as an instrument operational evaluation when the 8040A is being used in locations away from normal test equipment. It is not, however, to be used to verify the calibration accuracy of the 8040A.

Assemble the 8040A as follows:

a. Remove the contents of the box marked BATTERY COVER. (Four "C" size alkaline batteries, for nonrechargeable batteries. The

rechargeable batteries come mounted in place in the 8040A case.

b. The four nonrechargeable alkaline batteries are to be mounted in the battery clips (position as indicated on the 8040A case) then the battery cover secured in place with the two screws provided. When installing either battery pack note the guide tab on the edge of the cover and match it with the recess in the bottom center of the 8040A case.

Check the basic operation of the 8040A using the following procedure:

a. Turn the 8040A on.

b. Connect the red test lead to the V-Ω input terminal.

(DC Volts)

c. Select volts dc function (see FUNCTION SELECTION EXAMPLES) and 20 range.

d. Insert the test lead probe into the BTRY TEST hole located on the bottom of the 8040A case. The 8040A display will indicate the battery voltage; between 4.0 and 5.8 volts.

(AC Volts)

e. Select volts ac function and 200 mV range.

f. The 8040A display will indicate the ripple voltage created by the inverter. This voltage can be up to 60 mV ac during battery operation or 150 mV ac when using the charger/eliminator.

NOTE

Due to the charging of the input coupling capacitor it will take 5 to 10 seconds for this reading to settle.

(Ohms)

g. Select the resistance function and 2 range.

h. Insert the test probe tip into the mA input terminal. The 8040A display will indicate 0.1000 ±5 digits.

(DC mA)

i. Connect the red test lead to the mA input terminal.

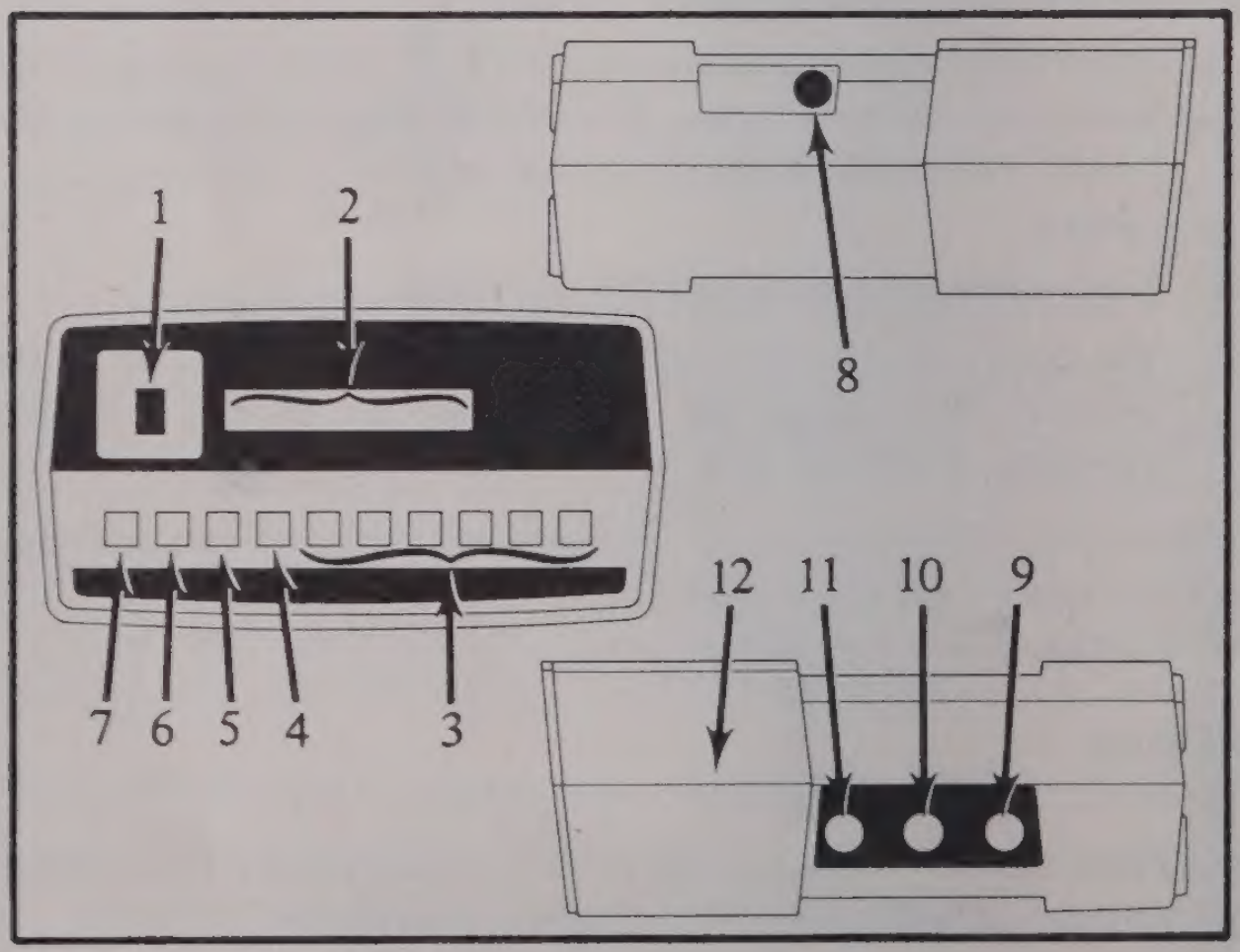
j. Select the direct current function and 2 range.

k. Insert the test probe tip into the BTRY TEST hole. The 8040A will indicate between 0.400 and 0.580 milliamps.

(AC mA)

l. Select the alternating current function. The 8040A display will indicate about the same as step k (mA input is dc coupled).

OPERATING CONTROLS



Item No.	Description
1	Power slide switch, disconnects power source from 8040A circuitry.
2	Display, 4½ digit (19999 maximum) with decimal and polarity sign. Annunciators at the right of the display indicate the units of measurement for the highest range (MΩ) and lowest range (mV-Ω-μA).
3	Range switches provide pushbutton selection of one of five ranges in dc or ac volts or current, and six ranges in resistance. Autoranging in the volts (ac or dc) and resistance functions is obtained by pressing the Auto button. DC VOLTS: 200 mV, 2, 20, 200, or 1100V. AC VOLTS: 200 mV, 2, 20, 200, or 750V rms. AC or DC Current: 200 μA, 2, 20, 200, or 2000 mA. Resistance: 200Ω, 2, 20, 200, 2000 kΩ, or 20 MΩ
4	kΩ selects resistance measurement function.
5	V ⎓ mA works in conjunction with the DC and AC switches to select the voltage function (out position) or current function (in position).
6	AC in conjunction with item 5 selects ac volts function or ac mA function.
7	DC in conjunction with item 5 select dc volts function or dc mA function.
8	BATTERY CHARGER/ELIMINATOR receptable provides connection for charger/eliminator.
9	V-Ω connection for high test lead for volts (ac or dc) function and resistance function.
10	COMMON connection for low test lead for all functions.
11	mA connection for high test lead for current measurement function. (2A fuse behind; push and turn 90° to remove.)
12	Sun Shade slides forward to improve readability in high light environments.

FUNCTION SELECTION EXAMPLES

Pushbutton Out

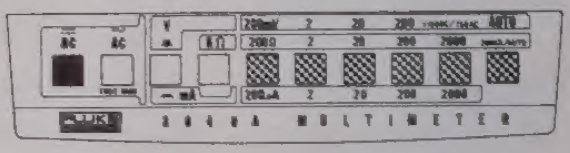
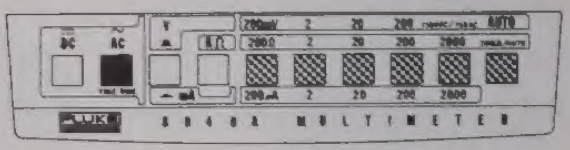
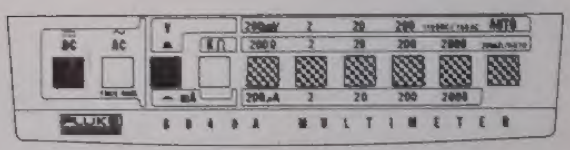
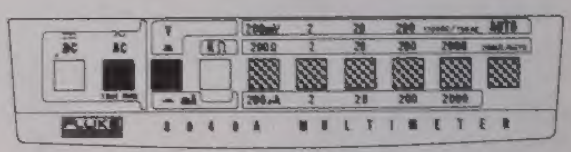
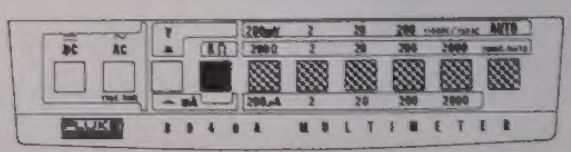
Pushbutton In

Operators Choice

Input LO Lead Connection

Input HI Lead Connection

No Connection

DESIRED FUNCTION	SWITCH POSITIONS	INPUT CONNECTIONS
Volts DC		
Volts AC		
Direct Current		
Alternating Current		
Resistance		

Rechargeable Battery Pack: ⚠

It is recommended that you do not replace individual batteries; order the 8040A-7005K rechargeable battery pack from the John Fluke Mfg. Co., Inc.

Do not put nonrechargeable batteries in the rechargeable battery pack since damage may result if alkaline, zinc-carbon, or mercury batteries are charged in the 8040A.

Battery manufacturers recommend that NiCad batteries be recharged at least every 90 days. Store temperatures below +25°C are recommended.

Nonrechargeable Battery Pack:

Replace the batteries with alkaline "C" size batteries only.

Battery manufacturers recommend that alkaline batteries be stored at temperatures below +25°C.

Battery Charger/Eliminator

The charger/eliminator must be connected to line source of the voltage indicated; connection to other voltage sources may cause damage.

CAUTION

To avoid electrical shock hazard use only the Fluke charger/eliminator (see ACCESSORIES list for part number).

Input Connection Voltage Limits:

See the specifications for the over-voltage limits for each function.

SPECIFICATIONS

DC VOLTS

Ranges: ±200 mV, ±2V, ±20V, ±200V, ±1100V (Auto-ranging or manual)

Accuracy: Six months, +18°C to +28°C
200 mV range; ±(0.05% of reading +3 digits)
2V thru 1100V range; ±(0.05% of reading +2 digits)

Input Impedance: 10 MΩ, all ranges.

Over-voltage: 200 mV and 2V ranges;
500V dc or rms ac (continuous)
1100V dc or peak ac for less than 10 sec.
20V, 200V and 1100V ranges;
1100V dc or peak ac (continuous)

AC VOLTS

Ranges: 200 mV, 2V, 20V, 200V, 750V

Accuracy: Six months, +18°C to +28°C
All ranges, from 5% of range to full range.
45 Hz to 10 kHz; ±(0.5% of reading +10 digits)
10 kHz to 20 kHz; ±(1.0% of reading +10 digits)

Input Impedance: 10 Megohm in parallel with less than 100 pF.

Over-voltage: 200 mV and 2V ranges;
500V rms or 700V peak ac (continuous)
750V rms, 1100V peak, or 10^7 volt-hertz (whichever is less); for less than 10 sec.
20V, 200V, and 750V ranges;
750V rms, 1100V peak, or 10^7 volt-hertz; whichever is less (continuous)

Crest Factor: 3.0

DC mA

Ranges: ±200 μA, ±2 mA, ±20 mA, ±200 mA, ±2000 mA

Accuracy: Six months, +18°C to +28°C
All ranges; ±(0.3% of reading +3 digits)

Maximum Input: 2 amps (fuse protected) any range.

AC mA

Ranges: 200 μA, 2 mA, 20 mA, 200 mA, 2000 mA

Accuracy: Six months, +18°C to +28°C, from 5% of range to full range

200 μA, 2 mA, 20 mA, 200 mA ranges;
45 Hz to 20 kHz; ±(1% of reading +10 digits)

2000 mA range;
45 Hz to 3 kHz; ±(1% of reading +10 digits)

Maximum Input: 2 amps (fuse protected) any range

Crest Factor: 3.0

RESISTANCE

Ranges: 200Ω, 2k, 20k, 200k, 2000k, 20 MΩ (Autoranging or manual)

Accuracy: Six months, +18°C to +28°C

200Ω thru 2000k ranges
±(0.2% of reading +3 digits)

20 MΩ range
+(0.5% of reading +3 digits)

Over-voltage: All ranges, 250V ac, 100V dc

ACCESSORIES

80I-600: A transformer type clamp on probe to measure currents of 2 to 600 amperes at frequencies of up to 1 kHz with ±3% accuracy.

80F-5: A 1000: 1 division ratio voltage probe capable of measurements up to 5k volts dc.

80F-15: A 1000: 1 division ratio voltage probe capable of measurements up to 15k volts dc.

80K-40: A 1000: 1 division ratio voltage probe capable of measurements up to 40k volts dc.

81RF:	A high frequency probe which extends the frequency range of the 8040A to include 100 MHz at voltages of 0.25V to 30V rms.
82RF:	A high frequency probe which extends the frequency range of the 8040A to include 100 kHz to 500 MHz at voltages of 0.25V to 30V rms.
80T-150C: or **80T-150F**	A temperature-to-voltage converter designed to provide direct temperature readings on the 8040A from –50 to +150°C (–58 to +302°F)
A81-115:	A battery charger/eliminator to supply charging or operating power to the 8040A from 115 volts ac, 50 to 60 Hz line source.
A81-100:	A battery charger/eliminator for use with a 100 volt ac, 50 to 60 Hz line source.
A81-230-1:	A battery charger/eliminator for use with a 230 volt ac, 50 to 60 Hz line source. (U.S. type plug.)
A81-230:	A battery charger/eliminator for use with a 230 volt ac, 50 to 60 Hz line source. (European type plug.)
C88:	A soft shelled carrying case including shoulder strap and accessories pouch.
A80:	A deluxe test lead kit that contains interchangeable probe tips and instrument connectors.
8040A-7004K:	A battery cover kit; includes 4 "C" size alkaline batteries.
8040A-7005K:	A rechargeable NiCad battery pack (batteries come secured in the battery cover).
8040A-7007K:	A battery cover intended for use with alkaline batteries (batteries not included).

The name and address of the John Fluke Mfg. Co., Inc. Distributor nearest you can be obtained by dialing toll free, **800-426-0361**. Each distributor maintains a supply of instruments and accessories so that when you need them they're ready for you.

NOTE

See the Maintenance Manual for schematics, calibration procedures and maintenance information.

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